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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XF246

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Chevron Richmond Refinery Long Wharf Maintenance and Efficiency Project in San Francisco Bay, California

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of an incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an incidental harassment authorization (IHA) to Chevron to incidentally harass, by Level B harassment only, marine mammals during construction activities associated with the Richmond Refinery Long Wharf Maintenance and Efficiency Project (WMEP) in San Francisco Bay, California.

DATES: The Authorization is in effect for one year beginning January 1, 2018 through December 31, 2018.

FOR FURTHER INFORMATION CONTACT:

Robert Pauline, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Availability

An electronic copy of Chevron's application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: www.nmfs.noaa.gov/pr/permits/incidental/construction.htm. In case of problems accessing these documents, please call the contact listed above (see **FOR FURTHER INFORMATION CONTACT**).

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

An authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth.

NMFS has defined “negligible impact” in 50 CFR 216.103 as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

The MMPA states that the term “take” means to harass, hunt, capture, kill or attempt to harass, hunt, capture, or kill any marine mammal.

Except with respect to certain activities not pertinent here, the MMPA defines “harassment” as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Summary of Request

On July 21, 2014, NMFS received a request from Chevron for authorization to take marine mammals incidental to pile driving and removal associated with the WMEP in San Francisco Bay, California. The project was delayed due to funding constraints. Chevron submitted a revised version of the request on November 16, 2016, which was deemed adequate and complete on January 12, 2017. Chevron will undertake the WMEP in order to comply with current Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) requirements and to improve safety and efficiency at the Long Wharf. Construction would start in 2018, and be complete by the fourth quarter of 2022. Therefore, Chevron expects to request additional IHAs in association with this multi-year project. The effective dates for this first IHA would be from January 1, 2018 through December 31, 2018. The use of both vibratory and impact pile driving during pile removal and installation during the four-year construction period is expected to produce underwater sound at levels that have the potential to result in Level B (behavioral) harassment of marine mammals. However, only impact driving will occur during 2018 and will be covered under the issued IHA. Species expected to occur in the area and for

which take is authorized include California sea lion (*Zalophus californianus*) and Pacific harbor seal (*Phoca vitulina*).

Description of the Specified Activity

Overview

Chevron's Richmond Refinery Long Wharf (Long Wharf) is the largest marine oil terminal in California. Its operations are regulated primarily by the California State Lands Commission (CSLC) through a State Lands lease, Article 5 of CSLC regulations, and MOTEMS (California Building Code (CBC) Chapter 31F). The Long Wharf has existed in its current location since the early 1900s (Figure 1-1 in Application). The Berth 2 fender system (timber pile and whaler) was designed and installed in 1940. Marine loading arms, gangways, and fender systems at Berths 1, 3 and 4 were installed in 1972. The Berth 4 fender panels were replaced in 2011 and the Berth 1 fender panels were replaced in 2012. The existing configuration of these systems have limitations to accepting more modern, fuel efficient vessels with shorter, parallel mid-body hulls and in some cases do not meet current MOTEMS requirements.

The purpose of the WMEP is to comply with current MOTEMS requirements and to improve safety and efficiency at the Long Wharf. To meet MOTEMS requirements, the fendering system at Berth 2 is being updated and the Berth 4 loading platform will be seismically retrofitted to stiffen the structure and reduce movement of the Long Wharf in the event of a level 1 or 2 earthquake. Safety will be improved by replacing gangways and fire monitors. Efficiency at the Long Wharf will be improved by updating the fender system configuration at Berth 4 to accommodate newer, more fuel efficient vessels and thus reduce idling time for vessels waiting to berth. Further, efficiency will be improved

by updating the fender system at Berth 1 to accommodate barges, enabling balanced utilization across Berths 1, 2, and 3.

Dates and Duration

Project construction will start in 2018 and be completed by the fourth quarter of 2022. Pile driving activities will be timed to occur within the standard NMFS work windows for listed fish species (June 1 through November 30) during those 4 years. The effective date for this initial IHA will be from January 1, 2018 through December 31, 2018. Over the course of the multi-year project, 249 piles of various sizes will be installed via impact and vibratory driving; 161 piles will be removed via vibratory removal; and 209 driving days are planned. During the first year of construction covered under this IHA, 8,24-inch concrete piles will be installed by impact driving over 4 workdays at Berth 2.

Specified Geographic Region

The Long Wharf is located in San Francisco Bay (the Bay) just south of the eastern terminus of the Richmond-San Rafael Bridge (RSRB) in Contra Costa County. The wharf is located in the northern portion of the Central Bay, which is generally defined as the area between the RSRB, Golden Gate Bridge, and San Francisco-Oakland Bay Bridge. The South Bay is located south of the San Francisco-Oakland Bay Bridge. San Pablo Bay extends north of the RSRB.

Detailed Description of Specified Activities

The complete multi-year project will involve modifications at 4 berths (Berths 1, 2, 3, and 4) as shown in Figure 1-1 in the Application. Planned modifications to the Long Wharf include replacing gangways and cranes, adding new mooring hooks and standoff

fenders, adding new dolphins and catwalks, and modifying the fire water system at Berths 1, 2, 3 and/or 4, as well as the seismic retrofit to the Berth 4 loading platform. The type and numbers of piles to be installed, as well as those that will be removed, are summarized in Table 1-1 in the Application and an overview of the modifications at Berths 1 to 4 are shown in Figure 1-2 in the Application.

The combined modifications to Berths 1-4 will require the installation of 141 new concrete piles to support new and replacement equipment and their associated structures. The Berth 4 loading platform will add 8, 60-inch diameter steel piles as part of the seismic retrofit.

The project will also add 4 clusters of 13 composite piles each (52 total) as markers and protection of the new batter (driven at an angle) piles on the east side of the Berth 4 retrofit. The project will remove 106 existing timber piles, two existing 18-inch and two existing 24-inch concrete piles. A total of 12 24-inch temporary steel piles will also be installed and removed during the seismic retrofit of Berth 4.

The modifications at each berth are summarized below.

Modifications at Berth 1 include the following:

- Replace gangway to accommodate barges and add a new raised fire monitor.
- Construct a new 24' x 20' mooring dolphin and hook to accommodate barges.
- Construct a new 24' x 25' breasting dolphin and 13' x 26' breasting point with standoff fenders to accommodate barges. The new breasting dolphin will require removal of an existing catwalk and two piles and moving a catwalk to a slightly different location to maintain access to currently existing dolphins. A new catwalk will be installed to provide access to the new breasting dolphin.

- A portion of the existing gangway will be removed. The remaining portion is used for other existing services located on its structure.

Much of this work will be above the water or on the deck of the terminal. The mooring dolphin and hook, breasting dolphin, and new gangway will require installation of 42 new 24-inch square concrete piles using impact driving methods.

Modifications at Berth 2 include the following:

- Install new gangway to replace portable gangway and add a new elevated fire monitor.

- Replace one bollard with a new hook.

- Install four new standoff fenders (to replace timber fender pile system).

- Replace existing auxiliary and hose cranes and vapor recovery crane to accommodate the new standoff fenders.

- Remove the existing timber fender pile system along the length of the Berth (~650 ft.)

- Three (3) existing brace piles (22-inch square concrete jacketed timber piles) would be removed by cutting below the mud line if possible.

These modifications will require the installation of 51 new 24-inch square concrete piles, using impact driving methods, to support the gangway, standoff fenders, hose crane, and auxiliary crane. To keep Berth 2 operational during construction, four temporary fenders will be installed, supported by 36 temporary 14-inch H-piles driven using vibratory methods. It is expected that the H-piles would largely sink under their own weight and would require very little driving. The H-piles and temporary fenders will be removed once the permanent standoff fenders are complete. The auxiliary and hose cranes

are being replaced with cranes with longer reach to accommodate the additional distance of the new standoff fenders. The new vapor recovery crane would be mounted on an existing pedestal and not require in-water work.

Modifications at Berth 3 include the following:

- Install new fixed gangway to replace portable gangway and add a new raised fire monitor. The gangway would be supported by four, 24-inch square concrete piles. This would be the only in-water work for modifications at Berth 3.

Modifications at Berth 4 include the following:

- Install two new 36' x 20' dolphins with standoff fenders (two per dolphin) and two catwalks.

- Seismically retrofit the Berth 4 loading platform including bolstering and relocation of piping and electrical facilities.

The new fenders would add 44 new 24-inch square concrete piles.

The seismic retrofit would structurally stiffen the Berth 4 Loading Platform under seismic loads. This will require cutting holes in the concrete decking and driving 8, 60-inch diameter hollow steel batter piles, using impact pile driving. To accommodate the new retrofit, an existing sump will be replaced with a new sump and two, 24-inch square concrete piles will be removed or cut to the mudline. The engineering team has determined that to drive the 60-inch batter piles, twelve temporary steel piles, 24 inches in diameter, will be needed to support templates for the angled piles during driving. Two templates are required, each 24 feet by 4 feet and supported by up to six 24-inch steel pipe piles. The templates will be above water. The project would also add 4 clusters of 13

composite piles each (52 total composite piles) as markers and protection of the new batter piles on the east side of the retrofit. See Table 1 for pile summary information.

Table 1. Summary of Pile Types, Sizes, Locations, and Installation/Removal Methods for Full Project 2018-2022.

Item	Description	No. Piles	Pile Installation / Removal Method
New Installation	Berth 1 Mooring Hook Dolphin	13	Impact
	Berth 1 Outer Breasting Dolphin	17	Impact
	Berth 1 Inner Breasting Point	8	Impact
	Berth 1 Gangway	4	Impact
	Berth 2 South Outside Fender	10	Impact
	Berth 2 South Inside Fender	10	Impact
	Berth 2 North Inside Fender	9	Impact
	Berth 2 North Outside Fender	10	Impact
	Berth 2 Main Hose Crane	4	Impact
	Berth 2 Aux Crane	4	Impact
	Berth 2 Gangway	4	Impact
	Berth 3 Gangway	4	Impact
	Berth 4 South Breasting Dolphin	22	Impact
	Berth 4 North Breasting Dolphin	22	Impact
	Total 24-inch Square Concrete Piles	141	
	Berth 4 Loading Platform Retrofit (60-inch-diameter Steel Piles)	8	Impact
	Berth 4 Barrier Piles (4 Clusters of 13 Composite Piles)	52	Vibrate
	Total	201	
Permanent Removal	Berth 1 Pile Removal	-2	Vibrate
	Berth 2 Pile Removal (106 Wooden - Actual Count)	-106	Vibrate
	Berth 2 Brace Piles (22-inch Square Concrete Jacketed Timber Piles)	-3	Cut
	Berth 4 Concrete Pile Removal	-2	Cut
	Total Removal	-113	
Net Change		88	
Temporary	Berth 1 Pile Installation and Removal	36	Vibrate
	Berth 2 Whaler Installation and Removal (excluding wooden Piles)	12	Vibrate
Total Installation		249	
Total Removal		116	

Note that the issued IHA covers actions occurring during 2018 only. These actions include the installation of 8, 24-inch concrete piles by impact hammer driving over 4 workdays. These piles will replace existing auxiliary and hose cranes and vapor recovery crane at Berth 2. Impact installation will occur utilizing a DelMag D62 22 or similar

diesel hammer, producing approximately 165,000 ft lbs maximum energy (may not need full energy) over a duration of approximately 20 minutes per pile.

Mitigation, monitoring, and reporting measures are described in in detail later in the document (*Mitigation* and *Monitoring and Reporting* sections).

Comments and Responses

A notice of NMFS's proposal to issue an IHA to Chevron was published in the **Federal Register** on March 24, 2017 (82 FR 05025). That notice described, in detail, Chevron's activity, the marine mammal species that may be affected by the activity, and the anticipated effects on marine mammals. During the 30-day public comment period, NMFS received comments from the Marine Mammal Commission. The Marine Mammal Commission recommended that NMFS issue the requested IHA, subject to inclusion of the mitigation, monitoring, and reporting measures as described in our notice of proposed IHA and the application. All measures proposed in the initial **Federal Register** notice are included within the IHA.

Description of Marine Mammals in the Area of the Specified Activity

Although 35 species of marine mammals can be found off the coast of California, few species venture into San Francisco Bay, and only Pacific harbor seals (*Phoca vitulina*), California sea lions (*Zalophus californianus*), and harbor porpoises (*Phocoena phocoena*) make the Bay a permanent home. Small numbers of gray whales (*Eschrichtius robustus*) are regularly sighted in the Bay during their yearly migration, though most sightings tend to occur in the Central Bay near the Golden Gate Bridge. Two other species that may occasionally occur within San Francisco Bay include the Steller sea lion (*Eumetopias jubatus*) and bottlenose dolphin (*Tursiops truncatus*). Table 2 provides

information about the species that are expected to potentially be present in the project area. A detailed description of the species likely to be affected by the project, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the **Federal Register** notice for the proposed IHA (82 FR 15025; March 24, 2017). Since that time, we are not aware of any changes in the status of these species and stocks; therefore, detailed descriptions are not provided here. Please refer to that **Federal Register** notice for these descriptions. Please also refer to NMFS' Web site (www.nmfs.noaa.gov/pr/species/mammals/) for generalized species accounts.

Table 2. Marine Mammals Potentially Present in the Vicinity of the Project.¹

Species	Stock	ESA/ MMPA status; strategic (Y/N) ²	Stock abundance (CV/ N _{min}) ³	PBR ⁴	Occurrence in/near project	Seasonal
Pacific harbor seal <i>Phoca vitulina</i>	California Stock	-/N	30,968 (- /27,348)	1,641	Common	Year-round
California sea lion <i>Zalophus californianus</i>	Eastern U.S. Stock	-/N	296,750 (- /153,337)	9,200	Uncommon	Year-round
Harbor porpoise <i>Phocoena phocoena</i>	San Francisco- Russian River Stock	-/N	9,886 (0.51/6,625)	66	Common in the vicinity of the Golden Gate and Richardson's Bay, Rare elsewhere	Year-round
Gray whale <i>Eschrichtius robustus</i>	Eastern North Pacific Stock	-/N	20,990 (0.05/20,125)	624	Rare to occasional	December – April

¹ Source: Carretta *et al.*, 2016

² ESA status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR (see footnote 3) or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any

species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

³ CV is coefficient of variation; N_{\min} is the minimum estimate of stock abundance. In some cases, CV is not applicable. For certain stocks of pinnipeds, abundance estimates are based upon observations of animals (often pups) ashore multiplied by some correction factor derived from knowledge of the species' (or similar species') life history to arrive at a best abundance estimate; therefore, there is no associated CV. In these cases, the minimum abundance may represent actual counts of all animals ashore.

⁴ Potential biological removal, defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population size (OSP).

Potential Effects of the Specified Activity on Marine Mammals and their Habitat

The effects of underwater noise from construction activities for the project have the potential to result in behavioral harassment of marine mammals in the vicinity of the action area. The **Federal Register** notice for the proposed IHA (82 FR 15025; March 24, 2017) included a discussion of the potential effects of anthropogenic noise on marine mammals, therefore that information is not repeated here; please refer to the **Federal Register** notice for that information.

The primary impacts to marine mammal habitat are associated with elevated sound levels produced by impact pile driving in the area. However, other potential impacts to the surrounding habitat from physical disturbance are also possible. The project would not result in permanent impacts to habitats used directly by marine mammals, such as haulout sites, but may have potential short-term impacts to food sources and minor impacts to the immediate substrate during installation of piles during the project. These potential effects are discussed in detail in the **Federal Register** notice for the proposed IHA (82 FR 15025; March 24, 2017), therefore, that information is not repeated here.

Estimated Take

This section includes an estimate of the number of incidental takes expected to occur as a result of the specified activities considered pursuant to this IHA, which will

inform both NMFS' consideration of whether the number of takes is small and the negligible impact determination.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes would be by Level B harassment only, in the form of disruption of behavioral for individual marine mammals resulting from exposure to impact driving. Based on the nature of the activity and the anticipated effectiveness of the mitigation measures (*i.e.*, shutdown, soft start discussed in detail below in *Proposed Mitigation* section), Level A harassment is neither anticipated nor authorized. The death of a marine mammal is also a type of incidental take. However, as described previously, no mortality is anticipated or authorized for this activity. Below we describe how the take is estimated.

In order to estimate the potential incidents of take that may occur incidental to the specified activity, we must first estimate the extent of the sound field that may be produced by the activity and then consider the sound field in combination with information about marine mammal density or abundance in the project area. We first provide information on applicable sound thresholds for determining effects to marine mammals before describing the information used in estimating the sound fields, the

available marine mammal density or abundance information, and the method of estimating potential incidences of take

Sound Thresholds—NMFS uses sound exposure thresholds to determine when an activity that produces underwater sound might result in impacts to a marine mammal such that a take by harassment might occur. On August 4, 2016, NMFS released its Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Guidance) (81 FR 51694) (available at <http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm>). This new guidance established new thresholds for predicting auditory injury, which equates to Level A harassment under the MMPA. As will be discussed below, NMFS has revised Permanent Threshold Shift (PTS) (and Temporary Threshold Shift (TTS)) onset acoustic thresholds for impulsive and non-impulsive sound as part of its new acoustic guidance. The Guidance does not address Level B harassment; therefore, NMFS uses the current acoustic exposure criteria to determine exposure to underwater noise sound pressure levels for Level B harassment (Table 5).

During the installation of piles, the project has the potential to increase airborne noise levels. Airborne pile-driving root means square (RMS) noise levels above the NMFS airborne noise thresholds are not expected to extend to the Castro Rocks haul-out site, which is located 650 meters (m) north of Long Wharf. In addition, the Castro Rocks haul out is subject to high levels of background noise from the Richmond Bridge, ongoing vessel activity at the Long Wharf, ferry traffic, and other general boat traffic. Any pinnipeds that surface in the area over which the airborne noise thresholds may be exceeded would have already been exposed to underwater noise levels above the

applicable thresholds and thus would not result in an additional incidental take. Airborne noise is not considered further.

Source Levels—Pile driving generates underwater noise that can potentially result in disturbance to marine mammals in the project area. In order to establish distances to PTS and behavioral harassment isopleths, the sound source level associated with a specific pile driving activity must be measured directly or estimated using proxy information. The intensity of pile driving sounds is greatly influenced by factors such as the material type and dimension of piles. To estimate the noise effects of the 24-inch square concrete piles planned for use in Year 1 of this project, Chevron reviewed sound pressure levels (SPLs) from other projects conducted under similar circumstances. These projects include the Pier 40 Berth Construction in San Francisco, and the Berth 22 and Berth 32 reconstruction projects at the Port of Oakland. However, NMFS elected to use data from only the Pier 40 project since 24-inch square concrete piles were installed at that location. At Berth 22 and Berth 32, 24-inch octagonal concrete piles were installed. The differences in pile shape may result in varying SPLs. Impact pile driving at Pier 40 resulted in measured RMS values ranging from 162-174 dB and peak SPLs from 172 to 186 dB. SEL measurements were not recorded. From Pier 40, NMFS selected a RMS value of 171 decibel (dB), which was the average of the eight piles tested, excluding two piles that utilized “jetting.” Jetting consists of employing a carefully directed and pressurized flow of water to assist in pile placement by liquefying soils at the pile tip during pile placement. Jetting tends to increase driving efficiency while decreasing sound levels and will not be utilized by Chevron during this project. Note that NMFS had incorrectly used a RMS value of 170 dB in the

Notice of Proposed IHA. Utilizing the corrected value of 171 dB results in slightly larger predicted Level A and Level B isopleths. NMFS used an identical approach to arrive at an average peak value of 181 dB based on results from Pier 40.

Sound Propagation—Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

$$TL = B * \log_{10} (R_1/R_2),$$

Where:

R1 = the distance of the modeled SPL from the driven pile, and

R2 = the distance from the driven pile of the initial measurement.

B = spreading loss value

This formula does not account for loss due to scattering and absorption, which is assumed to be zero here. The degree to which underwater sound propagates away from a sound source is dependent on a variety of factors, most notably the water bathymetry and presence or absence of reflective or absorptive conditions including in-water structures and sediments. Spherical spreading occurs in a perfectly unobstructed (free-field) environment not limited by depth or water surface, resulting in a 6 dB reduction in sound level for each doubling of distance from the source ($20 \cdot \log(\text{range})$). Cylindrical spreading occurs in an environment in which sound propagation is bounded by the water surface and sea bottom, resulting in a reduction of 3 dB in sound level for each doubling of distance from the source ($10 \cdot \log(\text{range})$). As is common practice in coastal waters, here we assume

practical spreading loss (4.5 dB reduction in sound level for each doubling of distance) here. Practical spreading is a compromise that is often used under conditions where water increases with depth as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions.

Level A Zone—Chevron’s Level A harassment zone was calculated by utilizing the methods presented in Appendix D of NMFS’ Guidance and the accompanying User Spreadsheet. The Guidance provides updated PTS onset thresholds using the cumulative SEL (SEL_{cum}) metric, which incorporates marine mammal auditory weighting functions, to identify the received levels, or acoustic thresholds, at which individual marine mammals are predicted to experience changes in their hearing sensitivity for acute, incidental exposure to all underwater anthropogenic sound sources. The Guidance and its companion User Spreadsheet provide alternative methodology for incorporating these more complex thresholds and associated weighting functions.

The User Spreadsheet accounts for weighting functions using Weighting Factor Adjustments (WFAs), and NMFS used the recommended values for impact driving therein (2 kilohertz (kHz)). Pile driving durations were estimated based on similar project experience. NMFS’ new acoustic thresholds use dual metrics of SEL_{cum} and peak sound level (PK) for impulsive sounds (*e.g.*, impact pile driving). The noise levels noted above were used in the Spreadsheet for 24-inch square concrete piles. It was estimated that two piles would be installed in one 24-hr workday with installation for each pile requiring approximately 300 blows. NMFS used an RMS of 171 dB and pulse duration of 0.1 seconds. Measured SEL values were not available for 24-inch square concrete piles.

Utilizing the User Spreadsheet, NMFS applied the updated PTS onset thresholds for impulsive PK and SELcum in the new acoustic guidance to determine distance to the isopleths for PTS onset for impact pile driving. In determining the cumulative sound exposure levels, the Guidance considers the duration of the activity, the sound exposure level produced by the source during a 24-hr period, and the generalized hearing range of the receiving species. In the case of the dual metric acoustic thresholds for impulsive sound, the larger of the two isopleths for calculating PTS onset is used. Results in Table 4 display the Level A injury zones for the various hearing groups.

Table 4. Injury Zones and Shutdown Zones For Hearing Groups Associated with Installation of 24-Inch Concrete Piles Via Impact Driving.

Hearing group	Low-frequency cetaceans (gray whale)	Mid-frequency cetaceans	High-frequency cetaceans (harbor porpoise)	Phocid pinnipeds (harbor seal)	Otariid pinnipeds (CA sea lion)
PTS Onset Acoustic Thresholds - Impulsive* (Received Level)	Lpk,flat: 219 dB L _E ,LF,24h: 183 dB	Lpk,flat: 230 dB L _E ,MF,24h: 185 dB	Lpk,flat: 202 dB L _E ,HF,24h: 155 dB	Lpk,flat: 218 dB L _E ,PW,24h: 185 dB	Lpk,flat: 232 dB L _E ,OW,24h: 203 dB
PTS Isopleth to threshold (m)	24.3	0.9	28.9	13.0	0.9
<p>* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.</p> <p>Note: Peak sound pressure (L_{pk}) has a reference value of 1 μPa, and cumulative sound exposure level (L_E) has a reference value of 1 μPa²s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript “flat” is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (<i>i.e.</i>, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.</p>					

The zone of influence (ZOI) refers to the area(s) in which SPLs equal or exceed NMFS' current Level B harassment thresholds (160 dB for impulse sound). Calculated radial distances to the 160 dB threshold assume a field free of obstruction. Assuming a source level of 171 dB RMS, installation of the 24-inch concrete piles is expected to produce underwater sound exceeding the Level B 160 dB RMS threshold over a distance of 54 meters (177 feet) (Table 5).

Table 5. Isopleth for Level B harassment associated with impact driving of 24-inch concrete piles.

Criterion	Definition	Threshold	Isopleth (distance from source)
Level B harassment	Behavioral disruption	160 dB RMS (impulse sources)	54 m

Density/Abundance—Data specifying a marine mammal's density or abundance in a given area can often be used to generate exposure estimates. However, no systematic line transect surveys of marine mammals have been performed in the San Francisco Bay near the project site. Density information for marine mammal species has been generated by Caltrans based on 15 years (2000-2015) of observations as part of the San Francisco-Oakland Bay Bridge replacement project (Caltrans 2016). The data revealed densities of 0.00004 animals/kilometer (km^2) for gray whale, 0.021 animals/ km^2 for harbor porpoise, 0.09 animals/ km^2 for California sea lion, and 0.17 animals/ km^2 for harbor seal. Utilization of these data to develop exposure estimates results in very small exposure values. Despite the near zero estimate provided through use of the Caltrans density data, local observational data led us to believe that this estimate may not be accurate in illustrating

the potential for take at this particular site, so we have to use other information. Instead, NMFS relied on local observational data as described below.

Take Estimate—The estimated number of marine mammals that may be exposed to noise at levels expected to result in take as defined in the MMPA is determined by comparing the calculated areas over which the Level B harassment threshold may be exceeded, as described above, with the expected distribution of marine mammal species within the vicinity of the project. NMFS calculated take qualitatively utilizing observational data taken during marine mammal monitoring associated with the RSRB retrofit project, the San Francisco-Oakland Bay Bridge replacement project, and other marine mammal observations for San Francisco Bay. As described previously in the *Effects* section, Level B Harassment is expected to occur and is authorized in the numbers identified below.

Pacific harbor seal

Castro Rocks is the largest harbor seal haul out site in the northern part of San Francisco Bay and is the second largest pupping site in the Bay (Green *et al.*, 2002). The pupping season is from March to June in San Francisco Bay. During the molting season (typically June-July and coinciding with the period when piles will be driven) as many as 129 harbor seals have been observed using Castro Rocks as a haul out. Harbor seals are more likely to be hauled out in the late afternoon and evening, and are more likely to be in the water during the morning and early afternoon (Green *et al.*, 2002). However, during the molting season, harbor seals spend more time hauled out and tend to enter the water later in the evening. During molting, harbor seals can stay onshore resting for an average

of 12 hours per day during the molt compared to around 7 hours per day outside of the pupping/molting seasons (NPS 2014).

Tidal stage is a major controlling factor of haul out usage at Castro Rocks with more seals present during low tides than high tide periods (Green *et al.*, 2002).

Additionally, the number of seals hauled out at Castro Rocks also varies with the time of day, with proportionally more animals hauled out during the nighttime hours (Green *et al.*, 2002). Therefore, the number of harbor seals in the water around Castro Rocks will vary throughout the work period. The take estimates are based on the highest number of harbor seals observed at Castro Rocks during 2007 to 2012 annual surveys (approximately 129 seals). Without site-specific data, it is impossible to determine how many hauled out seals enter the water and, of those, how many enter into the Level B harassment area. Given the relatively small size of the Level B harassment area compared to the large expanse of Bay water that is available to the seals, NMFS will assume that no more than 6 seals per day would enter into the Level B harassment area during the 40 minutes of pile driving per day scheduled to occur over 4 days. Therefore, NMFS authorizes Level B take of up to 6 seals per day may over 4 days of impact driving, resulting in a total of 24 authorized incidents of take.

California Sea Lion

Relatively few California sea lions are expected to be present in the project area during periods of pile driving, as there are no haul-outs utilized by this species in the vicinity. However, monitoring for the RSRB did observe small numbers of this species in the north and central portions of the Bay during working hours. During monitoring that occurred over a period of May 1998 to February 2002, California sea lions were sighted at

least 90 times in the northern portion of the Central Bay and at least 57 times near the San Francisco-Oakland Bay Bridge in the Central Bay. During monitoring for the San Francisco-Oakland Bay Bridge Project in the Central Bay, California sea lions were observed on 69 occasions in the vicinity of the bridge over a 14-year period from 2000-2014 (Caltrans 2015b). The limited data regarding these observations do not allow a quantitative assessment of potential take. Given the limited driving time, low number of sea lions that are likely to be found in the northern part of the Bay, and small size of the level B zone, NMFS is authorizing a total of two incidents of take for California sea lions.

Harbor Porpoise

A small but growing population of harbor porpoises utilizes San Francisco Bay. Harbor porpoises are typically spotted in the vicinity of Angel Island and the Golden Gate Bridge (6 and 12 km southwest respectively) (Keener 2011), but may utilize other areas in the Central Bay in low numbers, including the project area. The density and frequency of this usage throughout the Bay is unknown. For this IHA, NMFS is not authorizing take of any harbor porpoise since the exclusion zone will be conservatively set at 55 m, which is larger than the Level B zone isopleth of 54 m, and take can be avoided.

Gray Whale

The only whale species that enters San Francisco bay with any regularity is the gray whale. Gray whales occasionally enter the Bay during their northward migration period, and are most often sighted in the Bay between February and May. Most venture only about 2 to 3 km past the Golden Gate Bridge, but gray whales have occasionally been sighted as far north as San Pablo Bay. Impact pile driving is not expected to occur during this time, however, and gray whales are not likely to be present at other times of year.

Furthermore, the exclusion zone of 55 m for this species is larger than the Level B zone isopleth of 54 m. As such, NMFS is not authorizing any gray whale take.

Table 6 shows estimated Level B take for authorized species.

Table 6: Summary of Estimated Take by Species (Level B Harassment).

Pile Type	Pile Driver Type	Number of Piles	Number of Driving Days	Species	
				Harbor seal	CA sea lion
24-inch square concrete	Impact	8	4	24	2

Mitigation

Under section 101(a)(5)(D) of the MMPA, NMFS shall prescribe the permissible methods of taking by harassment pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for subsistence uses.

To ensure that the “least practicable impact” will be achieved, NMFS evaluates mitigation measures in consideration of the following factors in relation to one another:

- the manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, their habitat; and
- their availability for subsistence uses (latter where relevant); the proven or likely efficacy of the measures; and the practicability of the measures for applicant implementation.

Mitigation for Mammals and their Habitat

The following measures would apply to Chevron's mitigation through the exclusion zone and zone of influence (ZOI):

Time Restriction—For all in-water pile driving activities, Chevron shall operate only during daylight hours when visual monitoring of marine mammals can be conducted.

Seasonal Restriction— To minimize impacts to listed fish species, pile-driving activities would occur between June 1 and November 30.

Exclusion Zone—For all pile driving activities, Chevron will establish an exclusion zone intended to contain the area in which Level A harassment thresholds are exceeded. The purpose of the exclusion zone is to define an area within which shutdown of construction activity would occur upon sighting of a marine mammal within that area (or in anticipation of an animal entering the defined area), thus preventing potential injury of marine mammals. The calculated distance to Level A harassment isopleths threshold during impact pile driving, assuming a maximum of 2 piles per day is 28.9 m for harbor porpoise; 13.0 m for harbor seal; 0.9 m for California sea lion, and; 24.3 m for gray whales.

NMFS will require a 15 m exclusion zone for harbor seals and California sea lions. In order to prevent any take of the cetacean species, a 55 m exclusion zone will be required for harbor porpoises and gray whales, which exceeds the Level B harassment isopleth. A shutdown will occur prior to a marine mammal entering the shutdown zones. Activity will cease until the observer is confident that the animal is clear of the shutdown zone. The animal will be considered clear if:

- It has been observed leaving the shutdown zone; or

- It has not been seen in the shutdown zone for 30 minutes for cetaceans and 15 minutes for pinnipeds.

10-meter Shutdown Zone—During the in-water operation of heavy machinery (*e.g.*, barge movements), a 10-m shutdown zone for all marine mammals will be implemented. If a marine mammal comes within 10 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions.

Level B Harassment Zone (Zone of Influence)—The ZOI refers to the area(s) in which SPLs equal or exceed NMFS' current Level B harassment thresholds (160 dB rms for pulse sources). ZOIs provide utility for monitoring that is conducted for mitigation purposes (*i.e.*, exclusion zone monitoring) by establishing monitoring protocols for areas adjacent to the exclusion zone. Monitoring of the ZOI enables observers to be aware of, and communicate about, the presence of marine mammals within the project area but outside the exclusion zone and thus prepare for potential shutdowns of activity should those marine mammals approach the exclusion zone. However, the primary purpose of ZOI monitoring is to allow documentation of incidents of Level B harassment; ZOI monitoring is discussed in greater detail later (see *Monitoring and Reporting*). The modeled radial distances for the ZOI for impact pile driving of 24-inch square concrete piles is 54 m. NMFS will require a 55 m Level B zone for harbor seals and California sea lions.

In order to document observed incidents of harassment, monitors will record all marine mammals observed within the ZOI. Due to the relatively small ZOI and to the

monitoring locations chosen by Chevron we expect that two monitors will be able to observe the entire ZOI.

The shutdown zone and ZOI shall be monitored throughout the time required to install a pile. If a harbor seal or California sea lion is observed entering the ZOI, a Level B exposure shall be recorded and behaviors documented. That pile segment shall be completed without cessation, unless the animal approaches the shutdown zone. Pile installation shall be halted immediately before the animal enters the Level A zone.

If any marine mammal species other than those for which take is authorized, or if a species for which authorization has been granted but the number of authorized takes has been met enters or approaches the ZOI, all activities shall be shut down until the animal is observed leaving the ZOI or it has not been observed in the ZOI for 30 minutes for cetaceans and 15 minutes for pinnipeds.

Ramp up/Soft-start - A “soft-start” technique is intended to allow marine mammals to vacate the area before the pile driver reaches full power. For impact driving, an initial set of three strikes would be made by the hammer at reduced energy, followed by a 30-sec waiting period, then two subsequent three- strike sets before initiating continuous driving. Soft start will be required at the beginning of each day’s impact pile driving work and at any time following a cessation of impact pile driving of thirty minutes or longer.

If a marine mammal is present within a shutdown zone, ramping up shall be delayed until the animal(s) leaves the relevant shutdown zone. Activity shall begin only after the MMO has determined, through sighting, that the animal(s) has moved outside the relevant shutdown zone or it has not been observed in the shutdown zone for 30 minutes for cetaceans and 15 minutes for pinnipeds.

If an authorized species is present in the Level B harassment zone, ramping up shall begin and a Level B take shall be documented. Ramping up shall occur when these species are in the Level B harassment zone whether they entered the Level B zone from the Level A zone, or from outside the project area.

Pile Caps/Cushions- Chevron will employ the use of pile caps or cushions as sound attenuation devices to reduce impacts from sound exposure during impact pile driving.

Based on our evaluation of the applicant's measures, as well as other measures considered by NMFS, we have determined that the required mitigation measures provide the means effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an IHA for an activity, Section 101(a)(5)(D) of the MMPA states that NMFS must set forth, requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the action area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the action area (*e.g.*, presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and
- Mitigation and monitoring effectiveness.

Chevron will collect sighting data and will record behavioral responses to construction activities for marine mammal species observed in the project location during the period of activity. Monitoring will be conducted by qualified marine mammal observers (MMO), who are trained biologists, with the following minimum qualifications:

- Independent observers (*i.e.*, not construction personnel) are required;
- At least one observer must have prior experience working as an observer;

- Other observers may substitute education (undergraduate degree in biological science or related field) or training for experience;
- Ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates and times when in-water construction activities were suspended to avoid potential incidental injury from construction sound of marine mammals observed within a defined shutdown zone; and marine mammal behavior;
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary; and
- NMFS will require submission and approval of observer CVs.

Chevron will monitor the exclusion zones and Level B harassment zone before, during, and after pile driving, with at least two observers located at the best practicable vantage points. Based on our requirements, the Marine Mammal Monitoring Plan would implement the following procedures for pile driving:

- During observation periods, observers will continuously scan the area for marine mammals using binoculars and the naked eye;
- Monitoring shall begin 30 minutes prior to impact pile driving;
- Observers will conduct observations, meet training requirements, fill out data forms, and report findings in accordance with this IHA;
- If the exclusion zone is obscured by fog or poor lighting conditions, pile driving will not be initiated until the exclusion zone is clearly visible. Should such conditions arise while impact driving is underway, the activity would be halted;
- Observers will be in continuous contact with the construction personnel via two-way radio. A cellular phone will be used for back-up communications and for safety purposes;
- Observers will implement mitigation measures including monitoring of the shutdown and monitoring zones, clearing of the zones, and shutdown procedures; and
- At the end of the pile-driving day, post-construction monitoring will be conducted for 30 minutes beyond the cessation of pile driving.

Sound Source Verification

Sound Source Verification (SSV) testing of impact driving will be conducted under this IHA. Little data exist for source levels associated with installation of 24-in square concrete piles (including data on single strike sound exposure level metrics). Chevron will conduct in-situ measurements during installation of four out of eight piles. The SSV will be conducted by an acoustical firm with prior experience conducting SSV tests. NMFS must approve the acoustic monitoring plan. Final results will be sent to

NMFS. Findings will be used to establish Level A and Level B isopleths during impact driving of 24-in square concrete piles for future IHA's associated with this project.

Data Collection

We require that observers use approved data forms. Among other pieces of information, chevron will record detailed information about any implementation of shutdowns, including the distance of animals to the pile being driven, a description of specific actions that ensued, and resulting behavior of the animal, if any. In addition, Chevron will attempt to distinguish between the number of individual animals taken and the number of incidents of take, when possible. We require that, at a minimum, that the following information be recorded on sighting forms:

- Date and time that permitted construction activity begins or ends;
- Weather parameters (*e.g.*, percent cloud cover, percent glare, visibility) and Beaufort sea state;
- Species, numbers, and, if possible, sex and age class of observed marine mammals;
- Construction activities occurring during each sighting;
- Marine mammal behavior patterns observed, including bearing and direction of travel;
- Specific focus should be paid to behavioral reactions just prior to, or during, soft-start and shutdown procedures;
- Location of marine mammal, distance from observer to the marine mammal, and distance from pile driving activities to marine mammals;

- Record of whether an observation required the implementation of mitigation measures, including shutdown procedures and the duration of each shutdown; and
- Other human activity in the area. Record the hull numbers of fishing vessels if possible.

Reporting Measures

Chevron shall submit a draft report to NMFS within 90 days of the completion of marine mammal monitoring, or 60 days prior to the issuance of any subsequent IHA for this project (if required), whichever comes first. The annual report would detail the monitoring protocol, summarize the data recorded during monitoring, and estimate the number of marine mammals that may have been harassed. If no comments are received from NMFS within 30 days, the draft final report will become final. If comments are received, a final report must be submitted up to 30 days after receipt of comments.

Reports shall contain the following information:

- Summaries of monitoring effort (*e.g.*, total hours, total distances, and marine mammal distribution through the study period, accounting for sea state and other factors affecting visibility and detectability of marine mammals);
- Analyses of the effects of various factors influencing detectability of marine mammals (*e.g.*, sea state, number of observers, and fog/glare); and
- Species composition, occurrence, and distribution of marine mammal sightings, including date, numbers, age/size/gender categories (if determinable), and group sizes.

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA (if issued), such as an injury (Level A harassment), serious injury or mortality (*e.g.*, ship-strike, gear interaction, and/or entanglement), Chevron would immediately cease the specified activities and immediately report the incident to the Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator. The report would include the following information:

- Time, date, and location (latitude/longitude) of the incident;
- Name and type of vessel involved (if applicable);
- Vessel's speed during and leading up to the incident (if applicable);
- Description of the incident;
- Status of all sound source used in the 24 hours preceding the incident;
- Water depth;
- Environmental conditions (*e.g.*, wind speed and direction, Beaufort sea state, cloud cover, and visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;
- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s) (if equipment is available).

Activities would not resume until NMFS is able to review the circumstances of the prohibited take. NMFS would work with Chevron to determine necessary actions to minimize the likelihood of further prohibited take and ensure MMPA compliance.

Chevron would not be able to resume their activities until notified by NMFS via letter, email, or telephone.

In the event that Chevron discovers an injured or dead marine mammal, and the lead MMO determines that the cause of the injury or death is unknown and the death is relatively recent (*i.e.*, in less than a moderate state of decomposition as described in the next paragraph), Chevron would immediately report the incident to the Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator. The report would include the same information identified in the section above. Activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with Chevron to determine whether modifications in the activities are appropriate.

In the event that Chevron discovers an injured or dead marine mammal, and the lead MMO determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), Chevron would report the incident to Office of Protected Resources, NMFS, and West Coast Regional Stranding Coordinator, within 24 hours of the discovery. Chevron would provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network. Pile driving activities would be permitted to continue.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50

CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes, alone, is not enough information on which to base an impact determination. In addition to considering the authorized number of marine mammals that might be taken through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration, etc.), as well as effects on habitat, the status of the affected stocks, and the likely effectiveness of the mitigation. Consistent with the 1989 preamble for NMFS's implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into these analyses via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, this introductory discussion of our analyses applies to all the species listed in Table 7 given that the anticipated effects of Chevron's construction activities involving impact pile driving on marine mammals are expected to be relatively similar in nature. There is no information about the nature or severity of the impacts, or the size, status, or structure of any species or stock that would lead to a different analysis for this activity, or else species-specific factors would be identified and analyzed.

Impact pile driving activities associated with the project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment (behavioral disturbance), from underwater sounds generated from pile driving. Potential takes could occur if

individuals of these species are present in the ensonified zone when in-water construction is under way.

No marine mammal stocks for which incidental take authorization are listed as threatened or endangered under the ESA or determined to be strategic or depleted under the MMPA. No injuries or mortalities are anticipated to occur as a result of Chevron's impact pile driving activities. The relatively low marine mammal density and small shutdown zones make injury takes of marine mammals unlikely. In addition, the Level A exclusion zones would be thoroughly monitored before the impact pile driving occurs and driving activities would be postponed if a marine mammal is sighted entering the exclusion zones. The likelihood that marine mammals will be detected by trained observers is high under the environmental conditions described for the project. The employment of the soft-start mitigation measure would also allow marine mammal in or near the ZOI or exclusion zone to move away from the impact driving sound source. Therefore, the mitigation and monitoring measures are expected to eliminate the potential for injury and reduce the amount and intensity of behavioral harassment. Furthermore, the pile driving activities analyzed here are similar to, or less impactful than, numerous construction activities conducted in other similar locations which have taken place with no reported injuries or mortality to marine mammals, and no known long-term adverse consequences from behavioral harassment.

The takes that are anticipated and authorized are expected to be limited to short-term Level B harassment (behavioral) as only eight piles will be driven over 4 days with each pile requiring approximately 20 minutes of driving time. Marine mammals present near the action area and taken by Level B harassment would most likely show overt brief

disturbance (*e.g.* startle reaction) and avoidance of the area from elevated noise level during pile driving. Repeated exposures of individuals to levels of sound that may cause Level B harassment are unlikely to significantly disrupt foraging behavior. Thus, even repeated Level B harassment of some small subset of the overall stock is unlikely to result in any significant realized decrease in fitness for the affected individuals, and thus would not result in any adverse impact to the stock as a whole.

The project is not expected to have significant adverse effects on affected marine mammals' habitat. While EFH for several species does exist in the project area, the activities would not permanently modify existing marine mammal habitat. The activities may cause fish to leave the area temporarily. This could impact marine mammals' foraging opportunities in a limited portion of the foraging range; but, because of the short duration of the activities and the relatively small area of affected habitat, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

In summary, this negligible impact analysis is founded on the following factors: (1) The possibility of non-auditory injury, serious injury, or mortality may reasonably be considered discountable; (2) the anticipated incidents of Level B harassment consist of, at worst, temporary modifications in behavior; (3) the short duration of in-water construction activities (4 days, 160 minutes total driving time); (4) limited spatial impacts to marine mammal habitat; and (5) the presumed efficacy of the mitigation measures in reducing the effects of the specified activity to the level of least practicable impact. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activity will have only

short-term effects on individuals. The specified activity is not expected to impact rates of recruitment or survival and will therefore not result in population-level impacts.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the monitoring and mitigation measures, NMFS finds that the total marine mammal take from the activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under Section 101(a)(5)(D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, NMFS compares the number of individuals taken to the most appropriate estimation of the relevant species or stock size in our determination of whether an authorization is limited to small numbers of marine mammals.

The numbers of animals authorized to be taken would be considered small relative to the relevant stocks or populations (<0.01 percent for both species as shown in Table 7) even if each estimated taking occurred to a new individual. However, the likelihood that each take would occur to a new individual is extremely low. Further, these takes are likely to occur only within some small portion of the overall regional stock.

Table 7. Population abundance estimates, total authorized Level B take, and percentage of population that may be taken for the potentially affected species during the Project.

Species	Abundance*	Total Level B Take	Percentage of Stock or Population
Harbor seal	30,968 ¹	24	<0.01
California sea lion (U.S.)	296,750	2	<0.01

Stock)			
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*Abundance estimates are taken from the 2015 U.S. Pacific Marine Mammal Stock Assessments (Carretta *et al.*, 2016).

¹ California stock abundance estimate

Based on the analysis contained herein of the activity (including the mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act (ESA)

Issuance of an MMPA authorization requires compliance with the ESA. No incidental take of ESA-listed species is authorized or expected to result from this activity. Therefore, NMFS has determined that consultation under section 7 of the ESA is not required for this action.

National Environmental Policy Act (NEPA)

Issuance of an MMPA authorization requires compliance with NEPA. NMFS has established categorical exclusion (CE) status under NEPA for this action. As such, we have determined the issuance of the IHA is consistent with categories of activities identified in CE B4 of the Companion Manual for NAO 216-6A and we have not identified any extraordinary circumstances listed in Chapter 4 of the Companion Manual

for NAO 216-6A that would preclude this categorical exclusion. NMFS has prepared a CE memorandum for the record.

Authorization

As a result of these determinations, NMFS has issued an IHA to Chevron for the harassment of small numbers of harbor seals and California sea lions incidental to the Richmond Refinery Long Wharf Maintenance and Efficiency Project in San Francisco Bay, California effective for one year beginning January 1, 2018, provided the previously mentioned mitigation, monitoring and reporting requirements are incorporated.

Dated: June 9, 2017.

Donna S. Wieting,
Director, Office of Protected Resources,
National Marine Fisheries Service.

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